



# LACO ASSOCIATES

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November 21, 2005

3577.02

Humboldt County Department of Health and Human Services  
Division of Environmental Health  
100 H Street, Suite 100  
Eureka, California 95501

Attention: Mr. Mark Verhey, C.E.G.

Subject: Groundwater Monitoring Report; Third Quarter 2005  
HPI/Former Rio Dell Shell; 481 Wildwood Avenue, Rio Dell, California  
LOP No. 12261

Dear Mr. Verhey:

LACO ASSOCIATES (LACO) presents to the Humboldt County Division of Environmental Health (HCDEH) the results of groundwater monitoring for the third quarter of 2005 at 481 Wildwood Avenue in Rio Dell, California. This report has been prepared on behalf of Humboldt Petroleum, Inc. (HPI).

Please call or email if you have any questions or concerns.

Sincerely,  
LACO ASSOCIATES

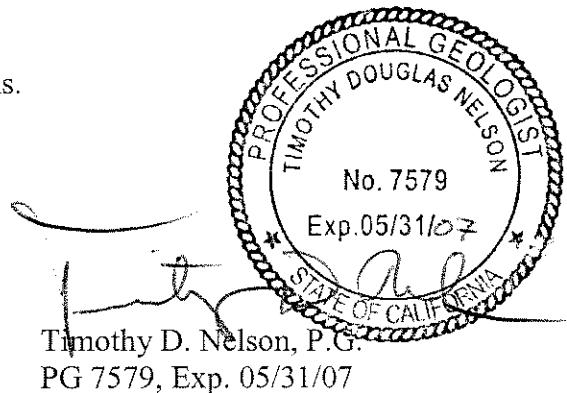
*Amy M. Thomson*  
Amy M. Thomson  
Staff Geologist

AMT:jg

Attachments

cc: Jim Seiler (electronically sent)

P:\3000\3577 HPI Rio Dell Shell\Submittals\GMRs\2005\2005\3Q 05\3577 3rd Q 05.doc



# **GROUNDWATER MONITORING REPORT; THIRD QUARTER 2005**

HPI/Fomer Rio Dell Shell; 481 Wildwood Avenue, Rio Dell, California

LOP No. 12261; LACO Project No. 3577.02

## **INTRODUCTION**

This report presents the cumulative results of groundwater monitoring conducted at the Former Rio Dell Shell site (hereafter referred to as the “site”) since 1999. Field activities associated with the third quarter 2005 groundwater monitoring event were conducted on September 22, 2005. Please refer to Table A, included below, for field sampling details for the third quarter of 2005. Monitoring well sampling protocol is included in LACO’s *Standard Operating Procedures* on file at your office. A location and a site map are provided as Figures 1 and 2, respectively.

## **SITE CHRONOLOGY**

- 1990:** Three single-wall steel gasoline underground storage tanks (USTs) were removed and replaced by two double-wall fiberglass gasoline USTs (one 10,000-gallon and one 12,000-gallon).
- Apr. 1999:** One 10,000-gallon and one 12,000-gallon UST used for gasoline, and associated piping from both USTs, were removed.
- Dec. 1999:** Five temporary soil borings (B1 through B5) and three monitoring wells (MW1, MW2, and MW3) were installed.
- June 2001:** Monitoring wells MW4, MW5, and MW6 were installed, and monitoring wells MW1 through MW3 were reconstructed.
- Aug. 2002:** Nine borings (B6 through B14), four observation wells (OW1 through OW4), and one extraction well (EW1) were installed.
- Oct. 2002:** Three monitoring wells were installed (MW7 through MW9).
- June 2004:** Monitoring well MW10 was installed

Table A: Field Sampling Data - September 22, 2005						
MONITORING WELL ID	SCREENED INTERVAL	DTW (feet bgs)	PURGE METHOD	WATER QUALITY PARAMETERS	ANALYTICALS	SAMPLING SCHEDULE
					ORGANICS	
MW1	18-25	9.84		Measure Only		
MW2	18-25	8.81	DHP	ORP and DO	TPHG, BTEX, MTBE, TBA, DIPE, ETBE, TAME	Quarterly
MW3	13-20	8.53	DHP	ORP and DO	TPHG, BTEX, MTBE, TBA, DIPE, ETBE, TAME	Quarterly
MW4	7-12	8.71	DHP	ORP and DO	TPHG, BTEX, MTBE, TBA, DIPE, ETBE, TAME	Quarterly
MW5	5-12	4.05	DHP	ORP and DO	TPHG, BTEX, MTBE, TBA, DIPE, ETBE, TAME	Quarterly
MW6	5-12	5.35	DHP	ORP and DO	TPHG, BTEX, MTBE, TBA, DIPE, ETBE, TAME	Quarterly
MW7	5-12	7.89	DHP	ORP and DO	TPHG, BTEX, MTBE, TBA, DIPE, ETBE, TAME	Quarterly
MW8	5-12	5.92	DHP	ORP and DO	TPHG, BTEX, MTBE, TBA, DIPE, ETBE, TAME	Quarterly
MW9	5-12	7.94	DHP	ORP and DO	TPHG, BTEX, MTBE, TBA, DIPE, ETBE, TAME	Quarterly
MW10	5-12	4.84	DHP	ORP and DO	TPHG, BTEX, MTBE, TBA, DIPE, ETBE, TAME	Quarterly

A key of this Table is included as Attachment 1.

## HYDROGEOLOGY

The subject property is located on colluvial deposits overlying Quaternary Eel River deposits, approximately 140 feet above sea level. The monitoring wells are screened at different intervals to collect groundwater from various units.

- The hydraulic gradient for the shallow aquifer was calculated using the hydraulic heads of monitoring wells MW5, MW8, MW9, and a three-point calculation. The calculated hydraulic gradient for the shallow aquifer for the current sampling event was calculated as 0.06 ft/ft in the N3°W direction.
- The hydraulic gradient for the deep aquifer, as calculated by using the three-point method in the area defined by monitoring wells MW1, MW2, and MW3, was < 0.01 ft/ft in the S83°W direction.

This hydraulic gradient data is consistent with previous hydraulic gradient calculations at this site. Hydraulic gradient contour maps for the shallow and deep aquifers, created with Surfer 7.0

software, are presented as Figures 3 and 4, respectively. Current and historic hydraulic head data are presented in Table 1, historic hydraulic gradient data are presented in Table 2, and a copy of the field sampling data sheets are included as Attachment 2.

## LABORATORY ANALYTICAL RESULTS

Groundwater analytical data from the September 22, 2005, quarterly sampling event are detailed in Table B, included below. Current and historic groundwater analytical data are included in Table 1, and copies of the laboratory analytical reports for this reporting period are included as Attachment 3.

Table B: Analytical Results for the September 22, 2005, Quarterly Sampling Event										
WELL	TPHg ( $\mu\text{g/L}$ )	Benzene ( $\mu\text{g/L}$ )	Toluene ( $\mu\text{g/L}$ )	Ethylbenzene ( $\mu\text{g/L}$ )	Xylenes ( $\mu\text{g/L}$ )	MTBE ( $\mu\text{g/L}$ )	TBA ( $\mu\text{g/L}$ )	TAME ( $\mu\text{g/L}$ )	ETBE ( $\mu\text{g/L}$ )	DIPE ( $\mu\text{g/L}$ )
MW1	---	---	---	---	---	---	---	---	---	---
MW2	52	<0.50	<0.50	<0.50	<0.50	31	<10	3.5	<1.0	<1.0
MW3	210	<0.50	<0.50	<0.50	<0.50	180	<10	14	<1.0	<1.0
MW4	<50	<0.50	<0.50	<0.50	<0.50	24	<10	3.2	<1.0	<1.0
MW5	1,100	7.8	<0.50	0.85	<0.50	480	72	88	<1.0	<1.0
MW6	66	<0.50	<0.50	<0.50	<0.50	<1.0	<50	<1.0	<1.0	<1.0
MW7	1,100	<0.50	<0.50	<0.50	<0.50	990	58	97	5.2	<1.0
MW8	510	<0.50	<0.50	<0.50	<0.50	430	57	56	2.1	<1.0
MW9	370	<0.50	<0.50	<0.50	<0.50	320	77	ND<1.0	3.0	<1.0
MW10	400	<0.50	<0.50	<0.50	<0.50	330	62	34	<2.0	<1.0

## DISCUSSION OF ANALYTICAL RESULTS

The North Coast Laboratories case narrative states that the reported gasoline values for monitoring wells MW2, MW3, MW7, MW8, MW9, and MW10 come from gasoline additives such as methyl tertiary butyl ether (MTBE). The primary contaminant of concern at this site is MTBE. The laboratory also noted that samples collected from monitoring well MW5 included the reported gasoline components and additives in addition to other peaks in the gasoline range.

For consistency of data evaluation, laboratory results from the current sampling event will be compared with historic sampling events exhibiting similar hydrologic conditions (September 2004). Since monitoring began at this site, there has been a significant lack of BTEX (benzene, toluene, ethylbenzene, and total xylenes), suggesting natural attenuation is occurring at the source and down gradient of the hydrocarbon plume.

Analytical results reported for the shallow and deep monitoring wells sampled during the third quarter of 2005 generally fall within the range of previously reported sampling events.

Monitoring well MW1 has not been sampled since June 2002; however, depth-to-water (DTW) is still measured with each sampling event.

In groundwater samples collected from monitoring well MW2, MTBE and tert-amyl methyl ether (TAME) increased within the same order of magnitude since September 2004, and TPHg increased slightly in concentration from non-detect (ND) to 52 $\mu$ g/L.

The reported analytes (TPHg, MTBE, and TAME) in monitoring well MW3 increased slightly in concentration within the same order of magnitude and remain above water quality objectives (WQOs). Similarly, the detected analytes in monitoring well MW4 increased within the same order of magnitude as the September 2004 sampling event, and remain above WQOs.

In monitoring well MW5, the concentrations of TPHg, benzene, ethylbenzene, and MTBE decreased in concentration within the same order of magnitude as samples collected in September 2004. The concentrations of tert-butyl alcohol (TBA) and TAME both decreased in concentration by one order of magnitude.

Groundwater samples collected from monitoring well MW6 indicate that TPHg concentrations have taken approximately 2 years to decrease by one order of magnitude. The concentration of MTBE in this monitoring well was reported as ND and has been below the WQO of 13 $\mu$ g/L since the beginning of sampling (July 2001). The lack of MTBE constituents in monitoring well MW6 confirms the presence of TPHg.

Groundwater samples collected from monitoring well MW7 indicate that the concentrations of TAME increased within the same order of magnitude, while TPHg and ethyl tertiary butyl ether (ETBE) decreased within the same order of magnitude, and MTBE and TBA decreased by one order of magnitude. Most analytes in monitoring well MW8 have increased slightly since the September 2004 sampling event; however the concentration of TBA decreased within the same order of magnitude. All detected analytes in monitoring well MW8 are above the WQOs with the exception of ETBE.

All analytes detected in monitoring well MW9 decreased in concentration. The concentration of TPHg, MTBE, and ETBE all decreased within the same order of magnitude, while the concentration of TBA decreased by one order of magnitude, and TAME decreased slightly to ND. In contrast, TPHg and TBA in monitoring well MW10 increased slightly, while MTBE and

TAME increased by one order of magnitude. Detected analytes in monitoring wells MW9 and MW10 remain above the WQOs.

## **INTRINSIC INDICATOR RESULTS AND DISCUSSION**

Field intrinsic bioremediation indicators dissolved oxygen (DO) and oxidation reduction potential (ORP) are routinely monitored during sampling. DO levels of +2.0 mg/L and greater, and ORP levels of +50 mV and greater, are typical of aerobic conditions at a site. Inversely, DO and ORP recordings below these thresholds generally indicate anaerobic conditions at a site. The recordings of DO and ORP obtained from monitoring wells for this sampling event exhibited levels below the threshold, which suggests anaerobic conditions exist at the locations of the monitoring wells.

## **RECOMMENDATION**

- The next sampling event is scheduled for December 2005.

## **LIMITATIONS**

LACO ASSOCIATES has exercised a standard of care equal to that generated for this industry to ensure that the information contained in this report is current and accurate. LACO ASSOCIATES disclaims any and all liability for any errors, omissions, or inaccuracies in the information and data presented in this report and/or any consequences arising there from, whether attributable to inadvertence or otherwise. LACO ASSOCIATES makes no representations or warranties of any kind, including but not limited to any implied warranties with respect to the accuracy or interpretations of the data furnished. LACO ASSOCIATES assumes no responsibility of any third party reliance on the data presented and that data generated for this report represents information gathered at that time and at the indicated locations. It should not be utilized by any third party to represent data for any other time or location. The report is valid solely for the purpose, site, and project described in this document. Any alteration, unauthorized distribution, or deviation from this description will invalidate this report.

## **LIST OF FIGURES, TABLES, AND ATTACHMENTS**

Figure 1: Location Map

Figure 2: Site Map

Figure 3: Hydraulic Gradient - Shallow Aquifer (9/22/05)

Figure 4: Hydraulic Gradient - Deep Aquifer (9/22/05)

Table 1: Well Data and Historic Groundwater Analytical Results

Table 2: Historic Hydraulic Gradient Data

Attachment 1: Key to Abbreviations

Attachment 2: Groundwater Sampling Field Data Sheets

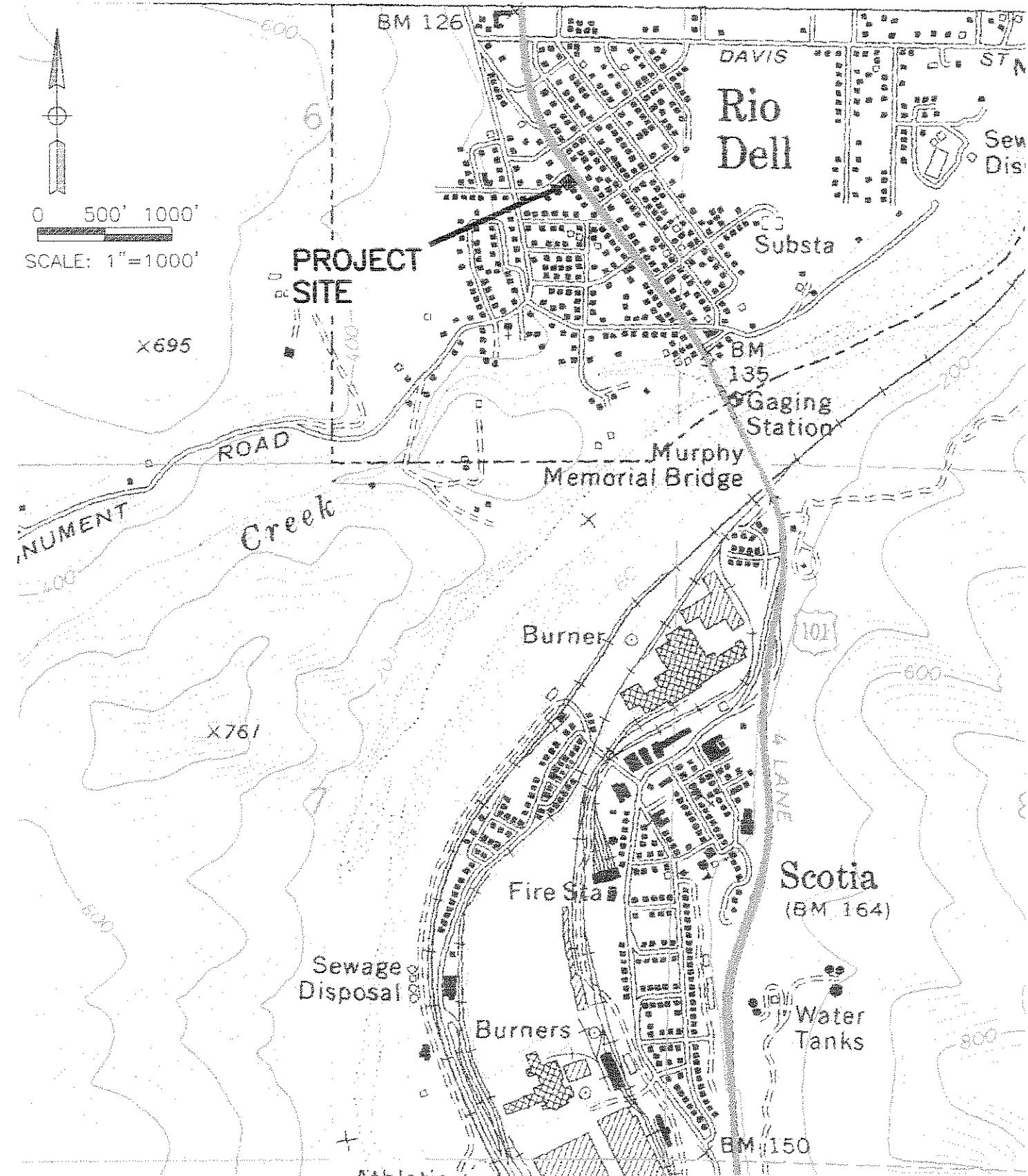
Attachment 3: Laboratory Analytical Reports



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PROJECT	GROUNDWATER MONITORING REPORT	BY	RJM	FIGURE
CLIENT	HUMBOLDT PETROLEUM INC.	DATE	10/24/05	1
LOCATION	481 WILDWOOD AVE, RIO DELL	CHECK	A	JOB NO.
LOCATION MAP		SCALE	1"=1000'	3577.02





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PROJECT	GROUNDWATER MONITORING REPORT	BY	BAB	FIGURE
CLIENT	HUMBOLDT PETROLEUM INC	DATE	10/24/05	2
LOCATION	481 WILDWOOD AVE, RIO DELL	CHECK	AT	JOB NO.
	SITE MAP	SCALE	1"=30'	3577.02

### LEGEND

FORMER UST'S – REMOVED 1990

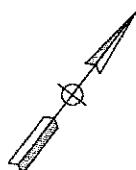
UST'S REMOVED 4/21/99

MONITORING WELL-SHALLOW

MONITORING WELL-DEEP

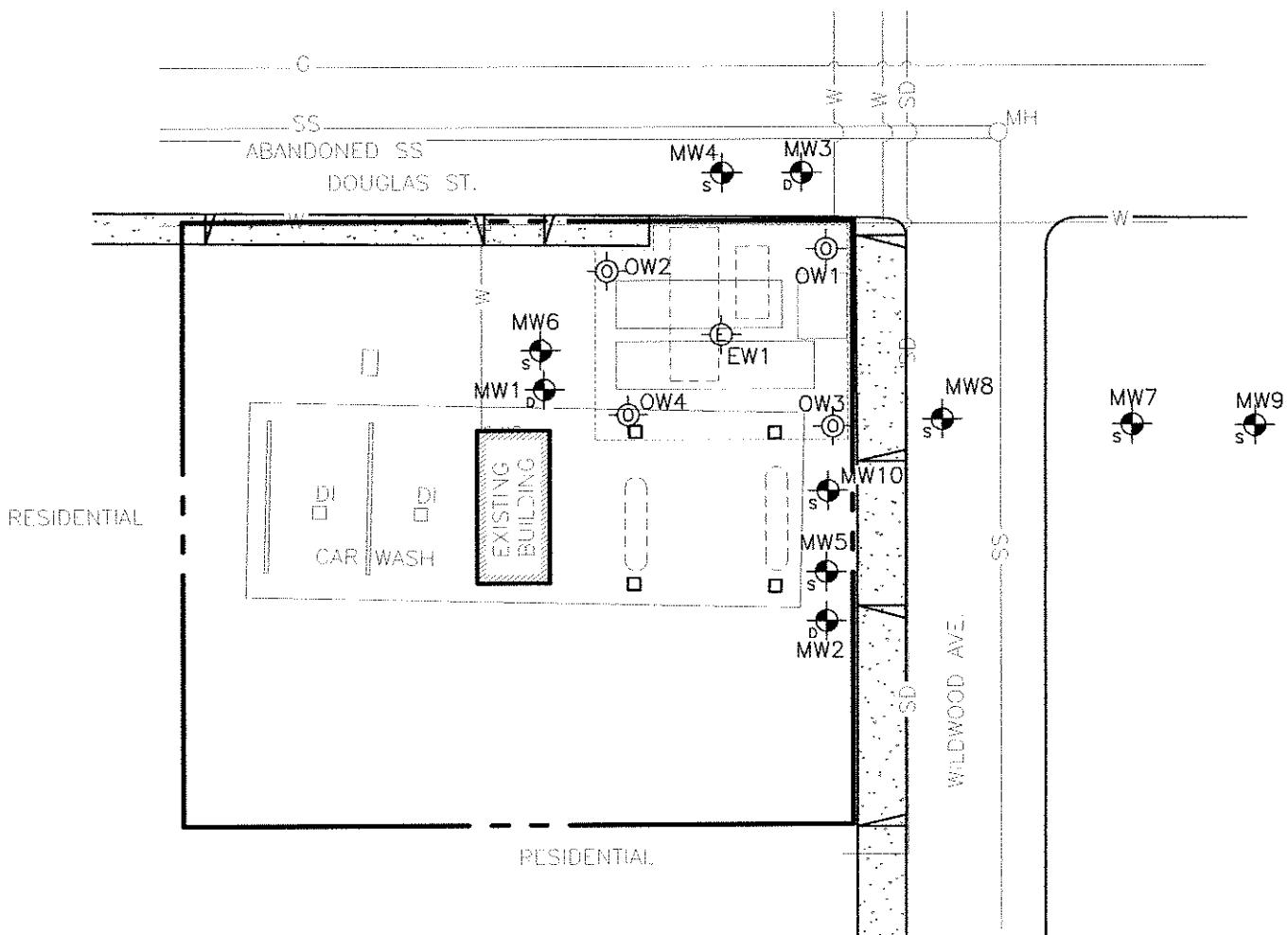
EXTRACTION WELL

OBSERVATION WELL



0 15' 30'

SCALE: 1"=30'





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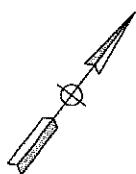
PROJECT	GROUNDWATER MONITORING REPORT	BY	BAB	FIGURE	3
CLIENT	HUMBOLDT PETROLEUM INC	DATE	10/24/05		
LOCATION	481 WILDWOOD AVE, RIO DELL	CHECK	AT	JOB NO.	
	HYDRAULIC GRADIENT-SHALLOW AQUIFER (9/22/05)	SCALE	1"=30'		3577.02

## LEGEND

[REMOVED] FORMER UST'S – REMOVED 1990

[REMOVED] UST'S REMOVED 4/21/99

- MONITORING WELL-SHALLOW
- MONITORING WELL-DEEP
- EXTRACTION WELL
- OBSERVATION WELL

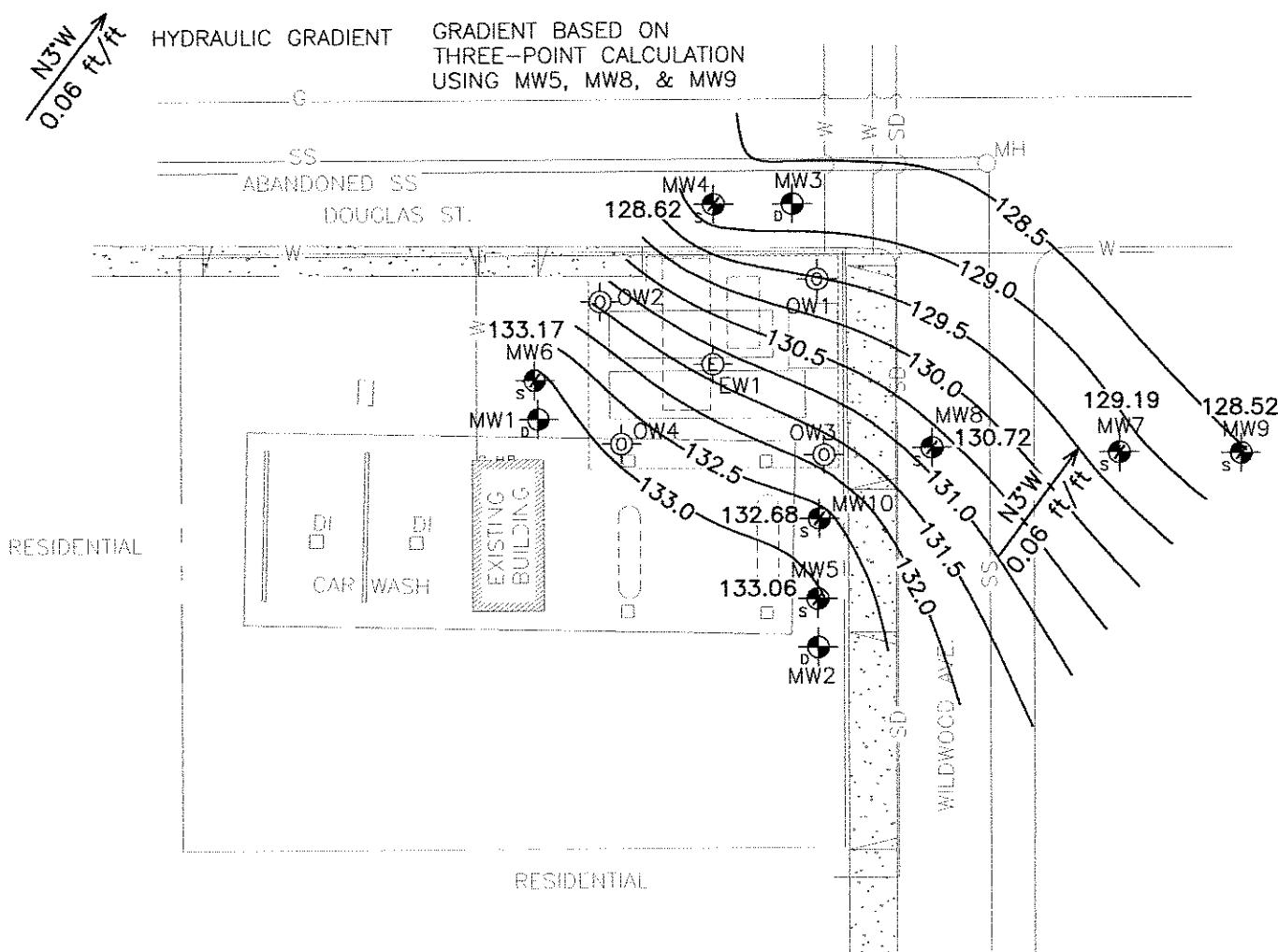


0 15' 30'  
SCALE: 1"=30'

—131.5—

EQUIPOTENTIAL LINES (FEET, NAVD 88)

HYDRAULIC GRADIENT      GRADIENT BASED ON  
THREE-POINT CALCULATION  
USING MW5, MW8, & MW9



### LEGEND

FORMER UST'S - REMOVED 1990

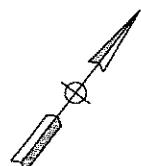
UST'S REMOVED 4/21/99

 MONITORING WELL-SHALLOW

 MONITORING WELL-DEEP

 EXTRACTION WELL

 OBSERVATION WELL



0 15' 30'  
SCALE: 1"=30'

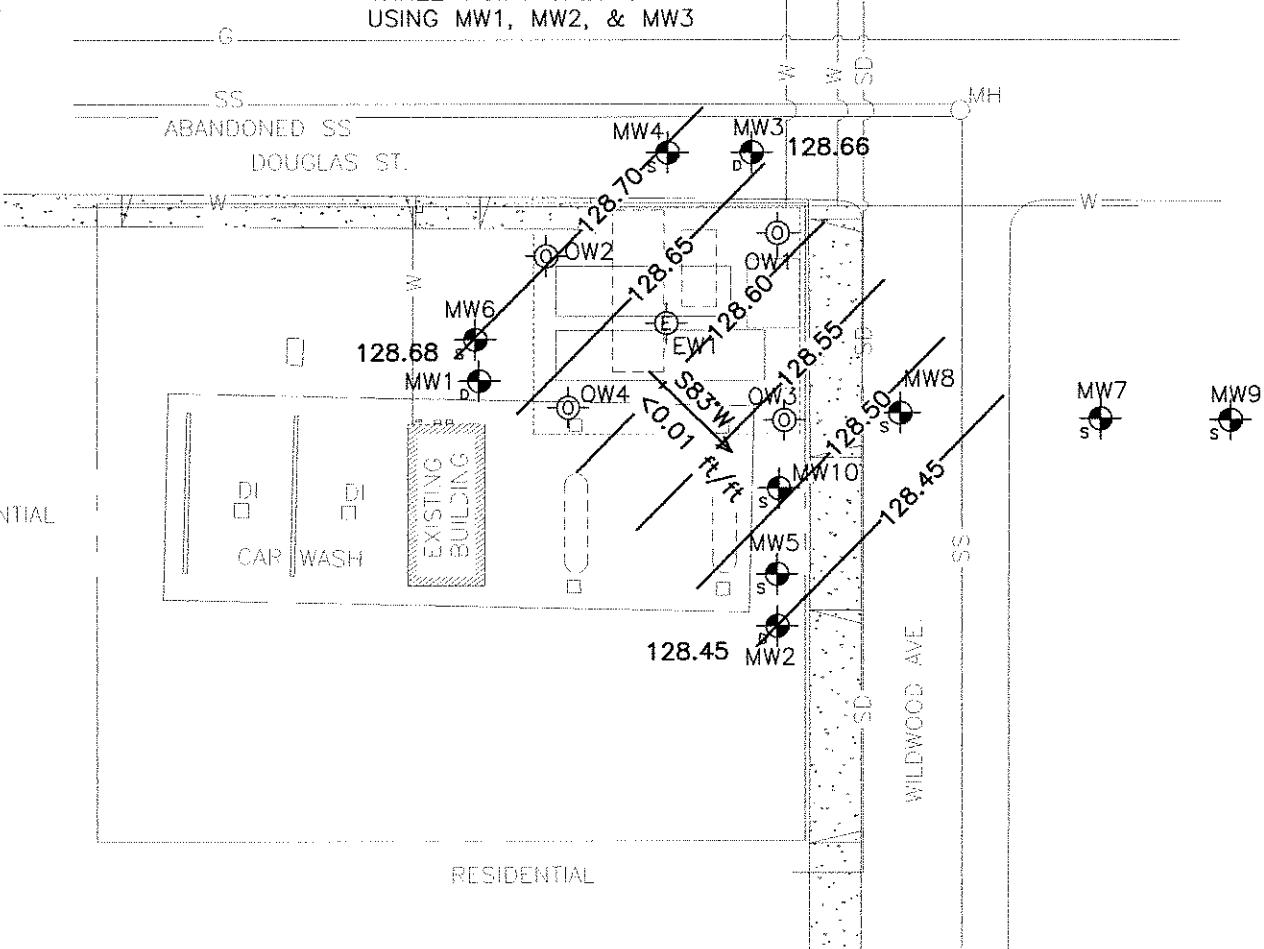
128.60 EQUIPOTENTIAL LINES (FEET, NAVD 88)

HYDRAULIC GRADIENT

GRADIENT BASED ON  
THREE-POINT CALCULATION  
USING MW1, MW2, & MW3

128.60  
S83°W  
0.01 ft/ft

RESIDENTIAL



**TABLE 1: WELL DATA AND GROUNDWATER ANALYTICAL RESULTS**  
 Former Rio Dell Shell, 481 Wildwood Avenue, Rio Dell, CA  
 LACO Project No. 3577-02; LOP No. 12261

Well ID	Sample Date	Well Head Elevation* (ft msl)	Water Surface Elevation (ft msl)	Depth to Water (ft)	Foot notes	TPHg (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	MTBE (µg/L)	TBA (µg/L)	TAME (µg/L)	ETBE (µg/L)	DPE (µg/L)	DIPE (µg/L)	Methanol/Ethanol (µg/L)
MW-1	12/28/1999	135.21	130.55	7.97	<50	<0.50	<0.50	<0.50	<0.50	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
	2/24/2000	132.09	6.43	---	---	---	---	---	---	---	---	---	---	---	---	---	
	3/21/2000	131.72	6.8	---	---	---	---	---	---	---	---	---	---	---	---	---	
	4/18/2000	130.71	7.81	<50	<0.50	<0.50	<0.50	<0.50	<0.50	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
	5/26/2000	130.45	8.07	---	---	---	---	---	---	---	---	---	---	---	---	---	
	6/30/2000	129.75	8.77	---	---	---	---	---	---	---	---	---	---	---	---	---	
	7/31/2000	129.07	9.45	<50	<0.50	<0.50	<0.50	<0.50	<0.50	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
	8/30/2000	128.55	9.97	---	---	---	---	---	---	---	---	---	---	---	---	---	
	9/22/2000	128.40	10.12	---	---	---	---	---	---	---	---	---	---	---	---	---	
	10/26/2000	127.94	10.58	<50	<0.50	<0.50	<0.50	<0.50	<0.50	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
	11/24/2000	128.04	10.48	---	---	---	---	---	---	---	---	---	---	---	---	---	
	12/12/2000	129.84	8.68	---	---	---	---	---	---	---	---	---	---	---	---	---	
	1/12/2001	130.12	8.4	<50	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
	2/22/2001	131.01	7.51	---	---	---	---	---	---	---	---	---	---	---	---	---	
	4/5/2001	130.96	7.56	---	---	---	---	---	---	---	---	---	---	---	---	---	
	5/2/2001	130.86	7.66	<50	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
6/14/01	138.52	Reconstructed		9.45	<50	<0.50	<0.50	<0.50	<0.50	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	Ethanol = 10
7/6/2001		129.07	127.86	10.66	---	---	---	---	---	---	---	---	---	---	---	---	
	9/4/2001	127.07	11.45	<50	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
10/18/2001		127.52	10	---	---	---	---	---	---	---	---	---	---	---	---	---	
11/29/2001		131.33	7.19	<50	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
1/2/2002		130.92	7.6	<50	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	Methanol = 77	
1/21/2002		131.38	7.14	---	---	---	---	---	---	---	---	---	---	---	---	---	
2/7/2002		131.01	7.51	<50	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
3/13/2002		130.42	8.1	---	---	---	---	---	---	---	---	---	---	---	---	---	
4/19/2002		130.44	8.08	---	---	---	---	---	---	---	---	---	---	---	---	---	
5/20/2002		129.62	8.9	<50	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
6/13/2002		129.07	127.86	10.66	---	---	---	---	---	---	---	---	---	---	---	---	
10/31/2002		131.04	7.48	---	---	---	---	---	---	---	---	---	---	---	---	---	
1/3/2003		133.81	4.71	---	---	---	---	---	---	---	---	---	---	---	---	---	
3/18/2003		131.69	6.83	---	---	---	---	---	---	---	---	---	---	---	---	---	
6/24/2003		129.83	8.69	---	---	---	---	---	---	---	---	---	---	---	---	---	
9/18/2003		128.70	10.32	---	---	---	---	---	---	---	---	---	---	---	---	---	
12/9/2003		129.17	9.35	---	---	---	---	---	---	---	---	---	---	---	---	---	
3/4/2004		131.47	9.05	---	---	---	---	---	---	---	---	---	---	---	---	---	
6/23/2004		127.54	10.98	---	---	---	---	---	---	---	---	---	---	---	---	---	
9/14/2004		129.63	8.89	---	---	---	---	---	---	---	---	---	---	---	---	---	
12/16/2004		130.94	7.58	---	---	---	---	---	---	---	---	---	---	---	---	---	
3/15/2005		130.82	7.7	---	---	---	---	---	---	---	---	---	---	---	---	---	
6/8/2005		128.68	9.84	---	---	---	---	---	---	---	---	---	---	---	---	---	
9/22/2005																	

**TABLE 1: WELL DATA AND GROUNDWATER ANALYTICAL RESULTS**  
 Former Rio Dell Shell, 481 Wildwood Avenue, Rio Dell, CA  
 LACCO Project No. 3577.02; LOP No. 12261

Well ID	Sample Date	Well Head Elevation* (ft msl)	Water Surface Elevation (ft msl)	Depth to Water (ft)	Foot notes	TPHg (ng/L)	Benzene (ng/L)	Toluene (ng/L)	Ethylbenzene (ng/L)	Total Xylenes (ng/L)	MTBE (ng/L)	TBA (ng/L)	TAME (ng/L)	ETBE (ng/L)	DPE (ng/L)	Methanol/Ethanol (ng/L)
MW-2	12/28/1999	133.88	130.41	6.85	<50	<0.50	<0.50	<0.50	<0.50	1.8	<10	<1.0	<1.0	<1.0	<1.0	<1.0
	2/24/2000	131.97	5.29	---	---	---	---	---	---	---	---	---	---	---	---	<1.0
	3/24/2000	131.59	5.67	---	---	<0.50	<0.50	<0.50	<0.50	21	<10	<1.0	<1.0	<1.0	<1.0	<1.0
4/18/2000	130.56	6.7	<50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	---	---	---	---	---	---	<1.0
5/26/2000	130.32	6.94	---	---	---	---	---	---	---	---	---	---	---	---	---	<1.0
6/30/2000	129.61	7.65	---	---	---	---	---	---	---	---	---	---	---	---	---	<1.0
7/31/2000	128.92	8.34	<50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	8.8	<10	<1.0	<1.0	<1.0	<1.0	<1.0
8/30/2000	128.41	8.85	---	---	---	---	---	---	---	---	---	---	---	---	---	<1.0
9/22/2000	128.28	8.98	---	---	---	---	---	---	---	---	---	---	---	---	---	<1.0
10/26/2000	128.03	9.23	<50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	22	<10	<1.0	<1.0	<1.0	<1.0	<1.0
11/24/2000	127.92	9.34	---	---	---	---	---	---	---	---	---	---	---	---	---	<1.0
12/12/2000	128.58	8.68	---	---	---	---	---	---	---	---	---	---	---	---	---	<1.0
1/12/2001	130.03	7.23	<50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	39	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0
2/22/2001	131.45	5.81	---	---	---	---	---	---	---	---	---	---	---	---	---	<1.0
4/5/2001	130.76	6.5	---	---	---	---	---	---	---	---	---	---	---	---	---	<1.0
5/2/2001	130.56	6.7	<50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	49	7.6	1.2	<1.0	<1.0	<1.0	<1.0
6/15/01	137.26	Reconstructed		---	---	---	---	---	---	---	---	---	---	---	---	<1.0
7/6/2001	129.19	8.07	<50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	7.9	5.4	<1.0	<1.0	<1.0	<1.0	<1.0
9/4/2001	128.02	9.24	---	---	---	---	---	---	---	---	---	---	---	---	---	<1.0
10/18/2001	127.06	10.2	74	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	5.1	12	<1.0	<1.0	<1.0	<1.0	<1.0
11/29/2001	128.53	8.73	---	---	---	---	---	---	---	---	---	---	---	---	---	<1.0
1/2/2002	131.34	5.92	<100	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	5.4	<10	<1.0	<1.0	<1.0	<1.0	<1.0
1/21/2002	130.92	6.34	<50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	7.3	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0
2/7/2002	131.35	5.91	---	---	---	---	---	---	---	---	---	---	---	---	---	<1.0
3/13/2002	131.01	6.25	<50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	8.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0
4/19/2002	130.42	6.84	---	---	---	---	---	---	---	---	---	---	---	---	---	<1.0
5/20/2002	130.41	6.85	---	---	---	---	---	---	---	---	---	---	---	---	---	<1.0
6/13/2002	129.80	7.46	<50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.78	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0
10/31/2002	132.49	4.77	<50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	6.3	<20	<1.0	<1.0	<1.0	<1.0	<1.0
1/3/2003	131.16	6.1	<50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	4.6	<20	<1.0	<1.0	<1.0	<1.0	<1.0
3/18/2003	130.98	6.28	<50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	11	<20	<1.0	<1.0	<1.0	<1.0	<1.0
6/24/2003	129.79	7.47	<50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	5.6	<20	<1.0	<1.0	<1.0	<1.0	<1.0
9/18/2003	128.17	9.09	50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	9.3	<20	<1.0	<1.0	<1.0	<1.0	<1.0
12/9/2003	129.16	8.10	<50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	7.0	<20	<1.0	<1.0	<1.0	<1.0	<1.0
3/4/2004	131.65	5.61	<50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	4.4	<10	<1.0	<1.0	<1.0	<1.0	<1.0
6/23/2004	129.44	7.82	<50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	18	<10	1.9	<1.0	<1.0	<1.0	<1.0
9/14/2004	127.49	9.77	<50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	19	<10	1.8	<1.0	<1.0	<1.0	<1.0
12/16/2004	129.61	7.65	<50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	18	<10	1.9	<1.0	<1.0	<1.0	<1.0
3/15/2005	130.86	6.40	<50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	12	<10	1.6	<1.0	<1.0	<1.0	<1.0
6/8/2005	131.81	5.45	<50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	8.5	<10	1.2	<1.0	<1.0	<1.0	<1.0
9/22/2005	128.45	8.81	52	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	31	<10	3.5	<1.0	<1.0	<1.0	<1.0

Notes: \*Elevation is relative to the water surface at the time of sampling.

\*\*Methanol = 87

**TABLE 1: WELL DATA AND GROUNDWATER ANALYTICAL RESULTS**  
 Former Rio Dell Shell, 481 Wildwood Avenue, Rio Dell, CA  
 LACO Project No. 3577-02; LOP No. 12261

Well ID	Sample Date	Well Head Elevation* (ft msl)	Water Surface Elevation (ft msl)	Depth to Water (ft)	Foot notes	TPHg (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	MTBE (µg/L)	TBA (µg/L)	TAME (µg/L)	ETBE (µg/L)	DPE (µg/L)	Methanol/Ethanol (µg/L)
MW-3	12/28/1999	134.11	130.55	6.64	73	<0.50	<0.50	<0.50	<0.50	240	<10	36	<1.0	<1.0	...	...
	2/24/2000	132.06	5.13	...	...	...	...	...	...	...	...	...	...	...	...	...
	3/21/2000	131.72	5.47	...	...	...	...	...	...	...	...	...	...	...	...	...
	4/18/2000	130.72	6.47	1,700	<1.0	<1.0	<1.0	<1.0	<1.0	3,700	<50	500	<1.0	<1.0	...	...
	5/26/2000	130.44	6.75	...	...	...	...	...	...	...	...	...	...	...	...	...
	6/30/2000	129.76	7.43	...	...	...	...	...	...	...	...	...	...	...	...	...
	7/31/2000	129.08	8.11	1,900	<1.0	<1.0	<1.0	<1.0	<1.0	2,400	<50	570	<1.0	<1.0	...	...
	8/30/2000	128.56	8.63	...	...	...	...	...	...	...	...	...	...	...	...	...
	9/22/2000	128.41	8.78	...	...	...	...	...	...	...	...	...	...	...	...	...
	10/26/2000	127.96	9.23	570	<2.5	<2.5	<2.5	<2.5	<2.5	900	<100	180	<1.0	<1.0	...	...
	11/24/2000	128.11	9.08	...	...	...	...	...	...	...	...	...	...	...	...	...
	12/12/2000	128.53	8.66	...	...	...	...	...	...	...	...	...	...	...	...	...
	1/12/2001	130.08	7.11	380	<2.0	<2.0	<2.0	<2.0	<2.0	1,600	<20	360	<1.0	<1.0	...	...
	2/22/2001	131.08	6.11	...	...	...	...	...	...	...	...	...	...	...	...	...
	4/5/2001	130.97	6.22	...	...	...	...	...	...	...	...	...	...	...	...	...
	5/2/2001	130.81	6.38	350	<2.5	<2.5	<2.5	<2.5	<2.5	1,300	27	320	<1.0	<1.0	...	...
	6/13/2001	137.19	Reconstructed		200	<2.0	<2.0	<2.0	<2.0	670	<20	140	<1.0	<1.0	...	...
	7/6/2001	129.24	7.95	...	...	...	...	...	...	...	...	...	...	...	...	...
	9/4/2001	128.31	8.88	...	...	...	...	...	...	...	...	...	...	...	...	...
	10/18/2001	127.06	10.13	140	<0.50	<0.50	<0.50	<0.50	<0.50	410	15	90	0.59	<1.0	...	...
	11/29/2001	128.46	8.73	...	...	...	...	...	...	...	...	...	...	...	...	...
	1/2/2002	131.30	5.89	290	<1.0	<1.0	<1.0	<1.0	<1.0	330	<20	61	<1.0	<1.0	...	...
	1/21/2002	130.92	6.27	240	<0.50	<0.50	<0.50	<0.50	<0.50	300	<10	47	<1.0	<1.0	...	...
	2/27/2002	131.29	5.9	...	...	...	...	...	...	...	...	...	...	...	...	...
	3/13/2002	130.97	6.22	120	<0.50	<0.50	<0.50	<0.50	<0.50	190	<5.0	24	<1.0	<1.0	...	...
	4/19/2002	130.33	8.86	...	...	...	...	...	...	...	...	...	...	...	...	...
	5/20/2002	130.45	6.74	...	...	...	...	...	...	...	...	...	...	...	...	...
	6/13/2002	129.84	7.35	160	<0.50	<0.50	<0.50	<0.50	<0.50	380	<5.0	34	1.2	<1.0	...	...
	10/31/2002	126.96	10.23	110	<0.50	<0.50	<0.50	<0.50	<0.50	210	<20	18	1.3	<1.0	...	...
	1/3/2003	130.99	6.2	100	<0.50	<0.50	<0.50	<0.50	<0.50	140	21	8.1	<1.0	1.1	...	...
	3/18/2003	131.04	6.15	150	<0.50	<0.50	<0.50	<0.50	<0.50	210	<20	23	<1.0	<1.0	...	...
	6/24/2003	129.83	7.36	270	<0.50	<0.50	<0.50	<0.50	<0.50	280	<20	28	1.3	<1.0	...	...
	9/18/2003	128.19	9.00	210	<0.50	<0.50	<0.50	<0.50	<0.50	130	<20	7.4	<1.0	<1.0	...	...
	12/9/2003	129.18	8.01	120	<0.50	<0.50	<0.50	<0.50	<0.50	150	<20	12	<1.0	<1.0	...	...
	3/4/2004	131.65	5.54	200	<0.50	<0.50	<0.50	<0.50	<0.50	210	<10	16	<1.0	<1.0	...	...
	6/23/2004	129.47	3	170	<0.50	<0.50	<0.50	<0.50	<0.50	150	<10	9.7	<1.0	<1.0	...	...
	9/14/2004	127.53	9.66	150	<0.50	<0.50	<0.50	<0.50	<0.50	120	<15	7.2	<1.0	<1.0	...	...
	12/16/2004	129.52	7.57	200	<0.50	<0.50	<0.50	<0.50	<0.50	160	<15	10	<1.0	<1.0	...	...
	3/15/2005	130.87	6.32	140	<0.50	<0.50	<0.50	<0.50	<0.50	180	<10	15	<1.0	<1.0	...	...
	6/8/2005	130.81	6.38	210	<0.50	<0.50	<0.50	<0.50	<0.50	180	<10	14	<1.0	<1.0	...	...
	9/22/2005	128.66	8.53	210	<0.50	<0.50	<0.50	<0.50	<0.50	180	<10	14	<1.0	<1.0	...	...

Methanol/Ethanol = 82

TABLE 1: WELL DATA AND GROUNDWATER ANALYTICAL RESULTS  
Former Rio Dell Shell, 481 Wildwood Avenue, Rio Dell, CA  
LACO Project No. 3577/02; LOP No. 12261

Well ID	Sample Date	Well Head Elevation* (ft msl)	Water Surface Elevation (ft msl)	Depth to Water (ft)	Foot notes	TPHg (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	MTBE (µg/L)	TBA (µg/L)	TAME (µg/L)	ETBE (µg/L)	DIPE (µg/L)	Methanol/Ethanol (µg/L)
MW-4	7/6/2001	137.33	128.84	8.49	<50	<0.50	<0.50	<0.50	<0.50	72	8.7	13	<1.0	<1.0	—	—
	9/4/2001	131.58	5.75	—	—	<0.50	<0.50	<0.50	<0.50	160	9.5	35	<1.0	<1.0	—	—
10/18/2001	130.90	6.43	86	<0.50	—	—	—	—	—	—	—	—	—	—	—	—
11/29/2001	132.68	4.65	—	—	—	<0.50	<0.50	<0.50	<0.50	160	9	40	<1.0	<1.0	—	—
1/21/2002	133.86	3.47	140	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	190	<5.0	45	<1.0	<1.0	—	Methanol = 57
2/27/2002	134.01	3.32	160	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	—	—	—	—	—	—	—
3/13/2002	134.49	2.84	—	—	—	<0.50	<0.50	<0.50	<0.50	68	<5.0	13	<1.0	<1.0	—	—
4/19/2002	133.83	3.50	<50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	—	—	—	—	—	—	—
5/20/2002	133.97	3.36	—	—	—	—	—	—	—	—	—	—	—	—	—	—
6/13/2002	134.08	3.25	—	—	—	—	—	—	—	—	—	—	—	—	—	—
10/31/2002	133.51	3.82	<50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	28	<5.0	4.6	<1.0	<1.0	—	Ethanol = 6.7
1/7/2003	130.84	6.49	<50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	41	<20	7.9	<1.0	<1.0	—	—
3/18/2003	133.92	3.41	<50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	22	<20	3.6	<1.0	<1.0	—	—
6/24/2003	131.32	6.01	<50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	22	<20	3.8	<1.0	<1.0	—	—
9/18/2003	129.77	7.56	68	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	32	<20	4.5	<1.0	<1.0	—	—
12/9/2003	129.46	7.87	94	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	33	<20	4.6	<1.0	<1.0	—	—
3/4/2004	130.17	7.16	<50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	16	<20	2.3	<1.0	<1.0	—	—
6/23/2004	129.80	7.53	<50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	27	<10	3.1	<1.0	<1.0	—	—
9/14/2004	129.27	8.06	<50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.5	24	4.2	<1.0	<1.0	—	—
12/16/2004	129.64	7.69	2	<50	<0.50	<0.50	<0.50	<0.50	<0.50	15	<10	2.1	<1.0	<1.0	—	—
3/15/2005	129.61	7.72	<50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	12	<10	1.6	<1.0	<1.0	—	—
6/8/2005	129.40	7.93	54	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	23	<10	3.5	<1.0	<1.0	—	—
9/22/2005	128.62	8.71	<50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	24	<10	3.2	<1.0	<1.0	—	—
MW-5	7/6/2001	137.11	127.07	10.04	<100	<1.0	<1.0	<1.0	<1.0	340	150	50	<1.0	<1.0	—	—
	9/4/2001	131.26	5.85	—	—	—	—	—	—	—	—	—	—	—	—	—
10/18/2001	131.96	5.15	1,200	150	<2.5	19	9.8	1,000	1,000	330	250	<1.0	<1.0	<1.0	—	—
11/29/2001	133.22	3.89	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1/21/2002	133.86	3.25	2,200	370	2.9	26	8.5	1,200	290	280	<1.0	<1.0	<1.0	—	—	Methanol = 130
1/21/2002	133.72	3.39	2,400	380	2.9	27	6.1	1,400	<30	320	<1.0	<1.0	<1.0	—	—	Methanol = 80
2/27/2002	132.95	4.16	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3/18/2002	130.43	6.68	910	85	1.1	11	3.9	790	<20	170	<1.0	<1.0	<1.0	<1.0	<1.0	—
4/19/2002	133.48	3.63	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5/20/2002	134.03	3.08	—	—	—	—	—	—	—	—	—	—	—	—	—	—
6/13/2002	133.78	3.33	1,500	270	1.7	15	3.2	1,400	380	250	<1.0	<1.0	<1.0	<1.0	<1.0	Methanol = 120
10/31/2002	132.39	4.72	2,200	3.6	24	—	5.56	1,200	470	340	1.2	<1.0	<1.0	<1.0	<1.0	—
1/3/2003	135.14	1.97	—	ND < 5.0	8.1	—	ND < 5.0	770	<20	210	<1.0	<1.0	<1.0	<1.0	<1.0	—
3/18/2003	133.64	3.47	1,600	310	2.2	17	2.60	710	110	160	<1.0	<1.0	<1.0	<1.0	<1.0	—
6/24/2003	132.90	4.21	2,300	280	2.0	24	1.80	780	150	180	<1.0	<1.0	<1.0	<1.0	<1.0	—
9/18/2003	132.00	5.11	1,700	32	1.0	10	1.30	910	99	210	<1.0	<1.0	<1.0	<1.0	<1.0	—
12/9/2003	132.38	4.73	1,000	17	0.65	7.1	1.30	880	94	210	<1.0	<1.0	<1.0	<1.0	<1.0	—
3/4/2004	133.54	3.57	1,400	95	1.1	7.2	0.98	940	130	180	<1.0	<1.0	<1.0	<1.0	<1.0	—
6/23/2004	133.29	3.82	2	1,600	51	0.75	5.3	1.2	760	130	170	<1.0	<1.0	<1.0	<1.0	—
9/14/2004	132.85	4.26	2	1,500	14	<0.50	2.3	0.68	650	100	120	<1.0	<1.0	<1.0	<1.0	—
12/16/2004	135.08	2.03	1,300	14	<0.50	1.8	0.56	670	90	120	<1.0	<1.0	<1.0	<1.0	<1.0	—
3/15/2005	133.73	3.38	890	2.7	<0.50	1.6	0.59	560	<10	130	<1.0	<1.0	<1.0	<1.0	<1.0	—
6/8/2005	133.76	3.35	1,300	16	<0.50	1.3	0.53	540	86	110	<1.0	<1.0	<1.0	<1.0	<1.0	—
9/22/2005	133.06	4.05	1,100	7.8	<0.50	0.85	<0.50	480	72	88	<1.0	<1.0	<1.0	<1.0	<1.0	—

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Former Rio Dell Shell, 481 Wildwood Avenue, Rio Dell, CA  
LACO Project No. 3577.02; LOP No. 12261

Well ID	Sample Date	Well Head Elevation* (ft msl)	Water Surface Elevation (ft msl)	Depth to Water (ft)	Foot notes	TPHg (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	MTBE (µg/L)	TBA (µg/L)	TAME (µg/L)	ETBE (µg/L)	DPE (µg/L)	TAME / ETBE (µg/L)	Methanol / Ethanol (µg/L)
MW-6	7/6/2001	138.52	129.57	8.95	<50	<0.50	<0.50	<0.50	<0.50	1.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	
	9/4/2001	129.46	9.06		---	---	---	---	---	---	---	---	---	---	---	---	
	10/18/2001	130.36	8.16	57	<0.50	<0.50	<0.50	<0.50	<0.50	2.1	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	
	11/29/2001	131.56	6.96		---	---	---	---	---	---	---	---	---	---	---	---	
	1/2/2002	133.19	5.33	<50	<0.50	<0.50	<0.50	<0.50	<0.50	0.81	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	
	1/21/2002	134.03	4.49	<50	<0.50	<0.50	<0.50	<0.50	<0.50	1.4	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	
	2/27/2002	132.35	6.17	---	---	---	---	---	---	---	---	---	---	---	---	---	
	3/13/2002	132.71	5.81	<50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0	<1.0	<1.0	
	4/19/2002	134.04	4.48	---	---	---	---	---	---	---	---	---	---	---	---	---	
	5/20/2002	134.21	4.31	---	---	---	---	---	---	---	---	---	---	---	---	---	
	6/13/2002	134.06	4.46	59	0.9	<0.50	<0.50	<0.50	<0.50	0.99	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	
	10/31/02	132.24	6.28	<50	2.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0	<1.0	<1.0	
	1/3/03	133.11	5.41	70	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0	<1.0	<1.0	
	3/18/03	132.77	5.75	58	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0	<1.0	<1.0	
	6/24/2003	131.24	7.28	120	0.65	<0.50	<0.50	<0.50	<0.50	1.0	<20	<1.0	<1.0	<1.0	<1.0	<1.0	
	9/18/2003	130.55	7.97	110	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0	<1.0	<1.0	
	12/9/2003	130.61	7.91	52	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0	<1.0	<1.0	
	3/4/2004	130.95	7.57	68	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0	<1.0	<1.0	
	6/23/2004	130.66	7.86	2	68	0.75	<0.50	<0.50	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0	<1.0	<1.0	
	9/14/2004	130.15	8.37	<50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0	<1.0	<1.0	
	12/16/2004	130.37	8.15	<50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0	<1.0	<1.0	
	3/15/2005	130.64	7.88	63	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0	<1.0	<1.0	
	6/8/2005	130.45	8.97	61	<0.50	<0.50	<0.50	<0.50	<0.50	1.1	<0.50	<1.0	<1.0	<1.0	<1.0	<1.0	
	9/22/2005	133.17	5.35	66	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0	<1.0	<1.0	
MW-7	10/31/2002	137.08	127.22	9.86	1,100	<0.50	<0.50	<0.50	<0.50	0.51	2,200	1,200	39	23	<1.0	<1.0	
	1/3/2003	131.69	5.39	200	<0.50	<0.50	<0.50	<0.50	<0.50	260	56	<1.0	<1.0	<1.0	<1.0	<1.0	
	3/18/2003	131.58	5.50	420	<0.50	<0.50	<0.50	<0.50	<0.50	620	130	22	8.5	<1.0	<1.0	<1.0	
	6/24/2003	130.65	6.43	720	<0.50	<0.50	<0.50	<0.50	<0.50	1,000	260	45	8.6	<1.0	<1.0	<1.0	
	9/18/2003	129.77	7.31	900	<0.50	<0.50	<0.50	<0.50	<0.50	1,000	190	45	6.8	<1.0	<1.0	<1.0	
	12/9/2003	129.76	7.32	710	<0.50	<0.50	<0.50	<0.50	<0.50	1,000	220	64	7.4	<1.0	<1.0	<1.0	
	3/4/2004	130.65	6.43	910	<0.50	<0.50	<0.50	<0.50	<0.50	1,300	320	80	7.3	<1.0	<1.0	<1.0	
	6/23/2004	130.66	7.92	3	1,100	<0.50	<0.50	<0.50	<0.50	1,200	240	78	7.3	<1.0	<1.0	<1.0	
	9/14/2004	129.35	7.73	3	1,300	<0.50	<0.50	<0.50	<0.50	1,000	210	73	5.7	<1.0	<1.0	<1.0	
	12/16/2004	129.85	7.23	3	1,200	<0.50	<0.50	<0.50	<0.50	1,100	160	79	5.6	<1.0	<1.0	<1.0	
	3/15/2005	130.01	7.97	810	<0.50	<0.50	<0.50	<0.50	<0.50	1,100	140	90	6.2	<1.0	<1.0	<1.0	
	6/8/2005	130.63	6.45	1,100	<0.50	<0.50	<0.50	<0.50	<0.50	1,100	95	89	5.9	<1.0	<1.0	<1.0	
	9/22/2005	129.19	7.89	1,100	<0.50	<0.50	<0.50	<0.50	<0.50	990	58	97	5.2	<1.0	<1.0	<1.0	
MW-8	10/31/02	136.64	126.38	10.26	220	<0.50	<0.50	<0.50	<0.50	0.51	400	560	26	2.9	<1.0	<1.0	
	1/2/03	132.88	3.76	160	<0.50	<0.50	<0.50	<0.50	<0.50	210	67	28	4.6	<1.0	<1.0	<1.0	
	3/18/03	131.79	4.85	270	<0.50	<0.50	<0.50	<0.50	<0.50	380	59	67	4.2	<1.0	<1.0	<1.0	
	6/24/2003	130.93	5.71	420	<0.50	<0.50	<0.50	<0.50	<0.50	460	120	76	3.3	<1.0	<1.0	<1.0	
	9/18/2003	130.81	5.83	830	<0.50	<0.50	<0.50	<0.50	<0.50	830	160	88	4.7	<1.0	<1.0	<1.0	
	12/9/2003	134.71	1.93	260	<0.50	<0.50	<0.50	<0.50	<0.50	300	74	40	2.2	<1.0	<1.0	<1.0	
	3/4/2004	132.63	4.01	570	<0.50	<0.50	<0.50	<0.50	<0.50	630	270	84	4.3	<1.0	<1.0	<1.0	
	6/23/2004	131.43	5.21	810	<0.50	<0.50	<0.50	<0.50	<0.50	700	190	88	4.2	<1.0	<1.0	<1.0	
	9/14/2004	131.11	5.53	3	500	<0.50	<0.50	<0.50	<0.50	3,600	77	54	1.9	<1.0	<1.0	<1.0	
	12/16/2004	131.69	4.95	3	730	<0.50	<0.50	<0.50	<0.50	6,000	130	69	3.2	<1.0	<1.0	<1.0	
	3/15/2005	131.39	5.25	410	<0.50	<0.50	<0.50	<0.50	<0.50	5,200	180	56	3.9	<1.0	<1.0	<1.0	
	6/8/2005	130.04	6.6	340	<0.50	<0.50	<0.50	<0.50	<0.50	3,000	57	33	1.9	<1.0	<1.0	<1.0	
	9/22/2005	130.72	5.92	510	<0.50	<0.50	<0.50	<0.50	<0.50	4,300	57	56	2.1	<1.0	<1.0	<1.0	

**TABLE 1: WELL DATA AND GROUNDWATER ANALYTICAL RESULTS**  
 Former Rio Dell Shell, 481 Wildwood Avenue, Rio Dell, CA  
 LACO Project No. 3577.02; LOP No. 17261

Well ID	Sample Date	Well Head Elevation* (ft msl)	Water Surface Elevation (ft msl)	Depth to Water (ft)	Foot notes	TPHg (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	MTBE (µg/L)	TBA (µg/L)	TAME (µg/L)	ETBE (µg/L)	DPE (µg/L)	Methanol/Ethanol (µg/L)
MW-9	10/31/02	136.46	125.46	11.00	200	<0.50	<0.50	<0.50	<0.50	33.0	23.0	2.5	3.4	<1.0	—	
1/3/03		128.96	7.50	66	<0.50	<0.50	<0.50	<0.50	<0.50	54	<1.0	3.5	<1.0	—	—	
3/18/03		130.86	5.60	180	<0.50	<0.50	<0.50	<0.50	<0.50	59	<1.0	4.2	<1.0	—	—	
6/24/2003		130.38	6.08	420	<0.50	<0.50	<0.50	<0.50	<0.50	420	200	1.2	5.6	1.1	—	
9/18/2003		129.09	7.37	450	<0.50	<0.50	<0.50	<0.50	<0.50	460	150	1.2	4.6	1.1	—	
12/9/2003		128.88	7.58	320	<0.50	<0.50	<0.50	<0.50	<0.50	400	140	1.2	4.5	<1.0	—	
3/4/2004		129.53	6.93	420	<0.50	<0.50	<0.50	<0.50	<0.50	500	250	1.2	5.2	<1.0	—	
6/23/2004		128.71	7.75	3	460	<0.50	<0.50	<0.50	<0.50	470	160	1.4	4.7	<1.0	—	
9/14/2004		127.84	8.62	3	460	<0.50	<0.50	<0.50	<0.50	370	160	1.0	3.7	<1.0	—	
12/16/2004		128.10	8.36	3	460	<0.50	<0.50	<0.50	<0.50	410	160	<1.0	3.8	<1.0	—	
3/15/2005		129.48	6.98	320	<0.50	<0.50	<0.50	<0.50	<0.50	420	160	1.2	4.4	<1.0	—	
6/8/2005		129.54	6.92	400	<0.50	<0.50	<0.50	<0.50	<0.50	370	100	1.1	4.0	<1.0	—	
9/22/2005		128.52	7.94	370	<0.50	<0.50	<0.50	<0.50	<0.50	320	77	<1.0	3.0	<1.0	—	
MW-10	6/23/2004	137.52	133.80	3.72	3,4	160	<0.50	<0.50	<0.50	140	<60	17	<1.0	<1.0	—	
9/14/2004		132.97	4.55	5,6	130	<0.50	<0.50	<0.50	<0.50	94	<30	8.2	<1.0	<1.0	—	
12/16/2004		134.41	3.11	3	410	<0.50	<0.50	<0.50	<0.50	350	62	29	<1.0	<1.0	—	
3/15/2005		133.59	3.93	340	<0.50	<0.50	<0.50	<0.50	<0.50	400	140	41	1.2	<1.0	—	
6/8/2005		133.10	4.42	420	<0.50	<0.50	<0.50	<0.50	<0.50	370	88	38	<2.0	<1.0	—	
9/22/2005		132.68	4.84	400	<0.50	<0.50	<0.50	<0.50	<0.50	330	62	34	<2.0	<1.0	—	

\*Reference NAVD 88, 11/02.  
 Elevations of 8/15/02 set by R. Smith, L.S. Used Caltrans HPGN monument "D CA 01 NC" south of Rio Dell @ Jordan Road/Hwy. 254 (Pepperwood) off-ramp

#### Laboratory Notations

<sup>1</sup> Samples does not present a peak pattern consistent with that of gasoline.

<sup>2</sup> The gasoline value includes the reported gasoline components and additives in addition to other peaks in the gasoline range.

<sup>3</sup> The gasoline value is primarily from the reported gasoline additives.

<sup>4</sup> TBA reporting limit was raised due to matrix interference.

<sup>5</sup> The gasoline value includes the reported gasoline additives in addition to other peaks in the gasoline range.

<sup>6</sup> Some reporting limits were raised due to matrix interference.

<sup>7</sup> The travel blank for this work order was prepared with water that had a high background of MTBE. The containers for this project were not affected as demonstrated by the ND results for sample MW6 (9/14/04)

**TABLE 2: HISTORIC HYDRAULIC GRADIENT DATA**

Former Rio Dell Shell, 481 Wildwood Ave., Rio Dell, CA

LACO Project No. 3577.02; LOP No. 12261

Date	Shallow Aquifer		Deep Aquifer	
	Direction	Slope (%)	Direction	Slope (%)
12/28/1999	---	---	S49°E	0.81
2/24/2000	---	---	S61°E	0.63
3/21/2000	---	---	S57°E	0.69
4/18/2000	---	---	S58°E	0.74
5/26/2000	---	---	S46°E	0.69
6/30/2000	---	---	S55°E	0.74
7/31/2000	---	---	S46°E	0.76
8/28/2000	---	---	S43°E	0.70
9/22/2000	---	---	S43°E	0.70
10/26/2000	---	---	S5°E	0.40
1/12/2001	---	---	S45°E	0.06
5/2/2001	---	---	S59°E	0.10
<b>shallow wells installed</b>		<b>deep wells reconstructed</b>		
6/1/2001				
7/6/2001	N73°E	4.5	S11°W	0.70
9/4/2001	S31°W	5.5	S20°W	0.70
10/18/2001	S87°W	2.7	N56°W	0.03
11/29/2001	S45°W	3.6	N35°W	0.10
1/2/2002	S35°W	1.8	N50°W	0.07
1/21/2002	N89°E	0.6	N76°W	0.04
2/27/2002	S20°W	5	N1°W	0.15
3/13/2002	S54°W	5.1	N27°W	0.10
4/19/2002	N85°E	1	N14°W	0.20
5/20/2002	N49°E	0.45	S41°E	0.03
6/13/2002	N21°W	1.36	S52°W	0.44
10/31/2002	N46°E	5.6	N77°W	9.30
1/3/2003	S85°W	4	N61°W	0.26
3/18/2003	N9°W	3.5	N50°E	6.30
6/24/2003	N20°W	4.3	S77°E	0.01
9/18/2003	N40°W	5.5	N79°E	0.05
12/9/2003	N21°E	1.1	S52°E	0.01
3/4/2004	N73°W	4.3	N50°E	0.08
6/23/2004	N57°W	5.3	S77°E	0.05
9/14/2004	N34°E	6.7	S77°E	0.07
12/16/2004	N3°E	10.9	N72°E	0.02
3/15/2005	N8°W	7.6	N55°E	0.10
6/8/2005	N33°W	5.6	N75°W	1.3
9/22/2005	N3°W	6.0	S83°W	0.4

# **Attachment 1**

## **ATTACHMENT 1: ABBREVIATIONS USED IN TABULATED DATA**

HPI/Former Rio Dell Shell  
481 Wildwood Avenue, Rio Dell  
LOP No. 12261; LACO No. 3577.02

### **KEY TO TABLE 1**

#### **Abbreviations**

ND = Not detected over the method detection limit

--- = Analyte not tested

$\mu\text{g/l}$  = micrograms per liter

mg/l = milligrams per liter

$\mu\text{mohs}$  = micromohs, a measure of electrical resistance

mV = millivolts

mcl = maximum contaminant level, an enforceable California or Federal drinking water standard.

al = action limit; a non-enforceable California drinking water standard; shown in parentheses.

tot = taste and odor threshold, a non-enforceable California drinking water standard.

TPHg = Total petroleum hydrocarbons as gasoline

TPHd = Total petroleum hydrocarbons as diesel

Oxygenates (fuel additives): methyl tertiary butyl ether (MTBE), di-isopropyl ether (DIPE),  
ethyl tertiary butyl ether (ETBE), tert-amyl methyl ether (TAME) and tert-butyl alcohol (TBA).

ORP = Oxidation-reduction potential

$\text{CaCO}_3$  = Calcium carbonate

$\text{CO}_2$  = Carbon dioxide

BOD = Biological oxygen demand

COD = Chemical oxygen demand

#### **Laboratory Notations**

<sup>1</sup> Sample does not present a peak pattern consistent with that of gasoline.

<sup>2</sup> Sample values includes the reported gasoline components and additives in addition to other peaks in  
the gasoline range

<sup>3</sup> Sample values are primarily from the reported gasoline additives.

<sup>4</sup> TBA reporting limit was raised due to matrix interference.

# **Attachment 2**

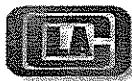


Project Name: HPI - Rio Dell Shell		Tech: SJD						
Project No.: 3577.02		Mob/Demob time: 1:50 / 1:25						
Date: 9-22-05		Travel time: 1:25						
Global ID No.: T0602300194		Time on site: 8:40						
PM: TDN		Time off site: 1:45						
WELL No.:	MW1	MW2	MW3					
DIAMETER (in)	2.00	2.00	2.00					
SCREENED INTERVAL (ft)	18-25	18-25	13-20					
DEPTH TO WATER (ft)	9.84	8.81	8.53					
	INITIAL	FINAL	INITIAL	FINAL	INITIAL	FINAL	INITIAL	FINAL
pH								
TEMP (°C)								
E <sub>CW</sub> (μmhos)								
ORP (mV)		-84	-59	-76	-62	-66	-73	-74
DO (mg/L)		1.02	0.42	1.26	0.44	1.03	0.63	1.00
OTHER (units)								
TIME	9:28	9:34	9:52	10:04	10:19	10:27	10:43	10:51
METHOD (DHP/CB/B)	DHP	DHP	DHP	DHP	DHP	DHP	DHP	DHP
RATE (Lpm)	0.20	0.18	0.19	0.19	0.19	0.19	0.19	0.19
VOLUME (L)	1.20	2.0	1.50	1.50	1.50	1.50	1.50	1.50
COLOR	CLEAR	CLOUDY	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR
ODOR	LIGHT SULFUR/SWEET	STRONG SULFUR	STRONG SULFUR	STRONG SULFUR	MB. SULFUR	MB. SULFUR	MB. SULFUR	MB. SULFUR
INTAKE DEPTH (FEET)	20.0	16.0	11.0	10.0	10.0	10.0	10.0	10.0
TIME	9:35	10:05	10:28	10:52				
METHOD (DHP/CB/B)	DHP	DHP	DHP	DHP				
ANALYTICS	MEASURE ONLY	8260 list 1	8260 list 1	8260 list 1	8260 list 1	8260 list 1	8260 list 1	8260 list 1
TOTAL DRAWDOWN (FEET)	0.2	0.07	0.64	0.79				
REMARKS								
WELL CONDITION	good	All THREE BOLT HOLES STRIPPED - ALL BOLTS MISSING	good	good				
WASTE DRUMS								

DHP=DOWN HOLE PUMP CB=CHECK BALL B=BAILER FD=FIELD DUPLICATE MB=METHOD BLANK FF=FIELD FILTERED



Project Name: HPI - Rio Dell Shell		Tech: SJD										
Project No.: 3577.02		Mob/Demob time: 1:50/1:25										
Date: 9-22-05		Travel time: 1:25										
Global ID No.: T0602300194		Time on site: 8:40										
PM: TDN		Time off site: 1:45										
		Mileage: 54										
WELL No.:	MW9	MW8	MW7	MW5	MW10							
DIAMETER (in)	2.00	2.00	2.00	2.00	2.00							
SCREENED INTERVAL (ft)	5-12	5-12	5-12	5-12	5-12							
DEPTH TO WATER (ft)	7.99	5.92	7.81	4.05	4.02							
FIELD INTRINSICS		INITIAL	FINAL	INITIAL	FINAL	INITIAL	FINAL	INITIAL	FINAL			
pH												
TEMP (°C)												
E <sub>CW</sub> (μmhos)												
ORP (mV)	-67	-75	-73	-85	-72	-79	-78	-81	-90	-97		
DO (mg/L)	1.31	0.49	1.21	0.67	1.03	0.45	1.16	0.47	0.98	0.55		
OTHER (units)												
PURGE		TIME	11:17	11:25	11:43	11:53	12:10	12:18	12:35	12:43	1:01	1:09
		METHOD (DHP/CB/B)	DHP		DHP		DHP		DHP		DHP	
		RATE (Lpm)	0.19		0.18		0.18		0.20		0.20	
		VOLUME (L)	1.50		1.75		1.40		1.60		1.60	
		COLOR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	LT. GREY TINT
		ODOR	LIGHT SULFUR/SWEET	LIGHT SWEET/SULFUR	LIGHT SWEET/SULFUR	LIGHT SWEET/SULFUR	MED. RUBBER/SWEET	SLIGHT SWEET/SULFUR	LIGHT SULFUR			
		INTAKE DEPTH (FEET)	10.0		10.0		10.0		10.0		10.0	
SAMPLE		TIME	11:26		11:54		12:19		12:44		1:10	
		METHOD (DHP/CB/B)	DHP		DHP		DHP		DHP		DHP	
		ANALYTIES	8260 list 1		8260 list 1		8260 list 1		8260 list 1		8260 list 1	
		TOTAL DRAWDOWN (FEET)	0.82		0.78		0.68		0.96		0.21	
		REMARKS										
WELL CONDITION		good		good		good		good		good		
WASTE DRUMS												



Project Name: <b>HPI - Rio Dell Shell</b>		Tech: <b>SJD</b>						
Project No.: <b>3577.02</b>		Mob/Demob time: <b>.50/.25</b>						
Date: <b>9-22-05</b>		Travel time: <b>1:25</b>						
Global ID No.: <b>T0602300194</b>		Time on site: <b>8:40</b>						
PM: <b>TDN</b>		Time off site: <b>1:45</b>						
WELL No.: <b>OW1</b>		Mileage: <b>54</b>						
DIAMETER (in) <b>.50</b>								
SCREENED INTERVAL (ft) <b>—</b>								
DEPTH TO WATER (ft) <b>2.88</b>		<b>4.11</b>						
		<b>3.25</b>						
		<b>3.05</b>						
FIELD INTRINSICS	INITIAL	FINAL	INITIAL	FINAL	INITIAL	FINAL	INITIAL	FINAL
	pH							
	TEMP (°C)							
	E <sub>CW</sub> (μmhos)							
	ORP (mV)							
	DO (mg/L)							
PURGE	OTHER (units)							
	TIME							
	METHOD (DHP/CB/B)							
	RATE (Lpm)							
	VOLUME (L)							
	COLOR							
SAMPLE	ODOR							
	INTAKE DEPTH (FEET)							
	TIME							
	METHOD (DHP/CB/B)							
	ANALYTES	<b>MEASURE ONLY</b>	<b>MEASURE ONLY</b>	<b>MEASURE ONLY</b>	<b>MEASURE ONLY</b>			
	TOTAL DRAWDOWN (FEET)							
REMARKS								
WELL CONDITION								
WASTE DRUMS								



# **LACO ASSOCIATES**

**CONSULTING ENGINEERS**

21 West Fourth Street, Eureka, CA 95501

TEL 707.443.5054

FAX 707.443.0553

Project Name: RIO DELL SHELL  
Project No.: 3577102

Tech: SJD  
Date: 9-22-05



# **LACO ASSOCIATES**

CONSULTING ENGINEERS

21 West Fourth Street, Eureka, CA 95501  
TEL 707.443.5054  
FAX 707.443.0553

Project Name: RIO DELL SHELL  
Project No.: 8517.02

Tech: SJD  
Date: 9-22-06

WELL ID: M1010

WELL ID:

WEILL ID:

WELL ID:



# **LACO ASSOCIATES**

**CONSULTING ENGINEERS**

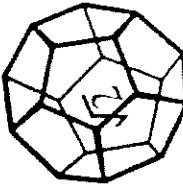
21 West Fourth Street, Eureka, CA 95501

TEL 707.443.5054

FAX 707.443.0553

Project Name: RIO DELL SHELL  
Project No.: 3577.02

Tech: SJD  
Date: 9-22-05



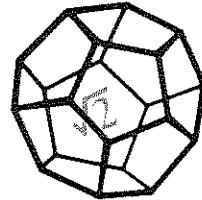
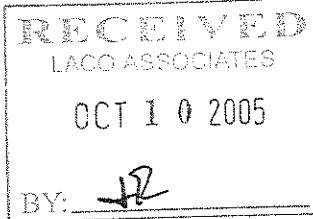
NORTH COAST  
LABORATORIES LTD.

5580 West Lind Road • Arcata • CA 95521-9402  
707.822.6444 [8.707.822.6444]

## Chain of Custody

\***MATRIX:** DW=Drinking Water; Eff=Effluent; Inf=Influent; SW=Surface Water; GW=Ground Water; S=Soil; O=Other

# **Attachment 3**



NORTH COAST  
LABORATORIES LTD.

October 07, 2005

LACO Associates  
P.O. Box 1023  
Eureka, CA 95502

Attn: Accounts Payable  
RE: 3577.02, HPI Rio Dell Shell

Order No.: 0509457  
Invoice No.: 53380  
PO No.: TASK-3027  
ELAP No. 1247-Expires July 2006

**SAMPLE IDENTIFICATION**

Fraction	Client Sample Description
01A	3577-MW2-W
02A	3577-MW3-W
03A	3577-MW4-W
04A	3577-MW5-W
05A	3577-MW6-W
06A	3577-MW7-W
07A	3577-MW8-W
08A	3577-MW9-W
09A	3577-MW10-W
10A	3577-QCTB-W

ND = Not Detected at the Reporting Limit

Limit = Reporting Limit

All solid results are expressed on a wet-weight basis unless otherwise noted.

LMO *[Signature]*  
DRG *[Signature]*  
DNL *[Signature]*  
GH *[Signature]*  
GEO *[Signature]*  
HPI *[Signature]*  
FRB *[Signature]*  
CJW *[Signature]*  
  
File \_\_\_\_\_  
Project # \_\_\_\_\_

**REPORT CERTIFIED BY**

*[Signature]*

Laboratory Supervisor(s)

*[Signature]*

QA Unit

*[Signature]*

Jesse G. Chaney, Jr.  
Laboratory Director

**CLIENT:** LACO Associates  
**Project:** 3577.02, HPI Rio Dell Shell  
**Lab Order:** 0509457

**CASE NARRATIVE****Gasoline Components/Additives:**

Sample 3577-MW6-W does not present a peak pattern consistent with that of gasoline. The reported result represents the amount of material in the gasoline range.

The gasoline value for sample 3577-MW5-W includes the reported gasoline components and additives in addition to other peaks in the gasoline range.

The gasoline values for samples 3577-MW2-W, 3577-MW3-W, 3577-MW7-W, 3577-MW8-W, 3577-MW9-W, and 3577-MW10-W are primarily from the reported gasoline additives.

Date: 06-Oct-05  
WorkOrder: 0509457

# ANALYTICAL REPORT

Client Sample ID: 3577-MW2-W      Received: 9/22/05      Collected: 9/22/05 0:00  
Lab ID: 0509457-01A      Matrix: Groundwater

Test Name:	Gasoline Components/Additives					
Parameter	Result	Limit	Units	DF	Extracted	Analyzed
Methyl tert-butyl ether (MTBE)	31	1.0	µg/L	1.0		10/3/05
Tert-butyl alcohol (TBA)	ND	10	µg/L	1.0		10/3/05
Di-isopropyl ether (DIPE)	ND	1.0	µg/L	1.0		10/3/05
Ethyl tert-butyl ether (ETBE)	ND	1.0	µg/L	1.0		10/3/05
Benzene	ND	0.50	µg/L	1.0		10/3/05
Tert-amyl methyl ether (TAME)	3.5	1.0	µg/L	1.0		10/3/05
Toluene	ND	0.50	µg/L	1.0		10/3/05
Ethylbenzene	ND	0.50	µg/L	1.0		10/3/05
m,p-Xylene	ND	0.50	µg/L	1.0		10/3/05
o-Xylene	ND	0.50	µg/L	1.0		10/3/05
Surrogate: 1,4-Dichlorobenzene-d4	104	80.8-139	% Rec	1.0		10/3/05

Test Name:	TPH as Gasoline					
Parameter	Result	Limit	Units	DF	Extracted	Analyzed
TPHC Gasoline	52	50	µg/L	1.0		10/3/05

Client Sample ID: 3577-MW3-W      Received: 9/22/05      Collected: 9/22/05 0:00  
Lab ID: 0509457-02A      Matrix: Groundwater

Test Name:	Gasoline Components/Additives					
Parameter	Result	Limit	Units	DF	Extracted	Analyzed
Methyl tert-butyl ether (MTBE)	180	50	µg/L	50		10/3/05
Tert-butyl alcohol (TBA)	ND	10	µg/L	1.0		10/3/05
Di-isopropyl ether (DIPE)	ND	1.0	µg/L	1.0		10/3/05
Ethyl tert-butyl ether (ETBE)	ND	1.0	µg/L	1.0		10/3/05
Benzene	ND	0.50	µg/L	1.0		10/3/05
Tert-amyl methyl ether (TAME)	14	1.0	µg/L	1.0		10/3/05
Toluene	ND	0.50	µg/L	1.0		10/3/05
Ethylbenzene	ND	0.50	µg/L	1.0		10/3/05
m,p-Xylene	ND	0.50	µg/L	1.0		10/3/05
o-Xylene	ND	0.50	µg/L	1.0		10/3/05
Surrogate: 1,4-Dichlorobenzene-d4	106	80.8-139	% Rec	1.0		10/3/05

Test Name:	TPH as Gasoline					
Parameter	Result	Limit	Units	DF	Extracted	Analyzed
TPHC Gasoline	210	50	µg/L	1.0		10/3/05

Date: 06-Oct-05  
WorkOrder: 0509457

## ANALYTICAL REPORT

Client Sample ID: 3577-MW4-W      Received: 9/22/05      Collected: 9/22/05 0:00  
Lab ID: 0509457-03A      Matrix: Groundwater

Test Name: Gasoline Components/Additives		Reference: LUFT/EPA 8260B Modified				
Parameter	Result	Limit	Units	DF	Extracted	Analyzed
Methyl tert-butyl ether (MTBE)	24	1.0	µg/L	1.0		10/3/05
Tert-butyl alcohol (TBA)	ND	10	µg/L	1.0		10/3/05
Di-isopropyl ether (DIPE)	ND	1.0	µg/L	1.0		10/3/05
Ethyl tert-butyl ether (ETBE)	ND	1.0	µg/L	1.0		10/3/05
Benzene	ND	0.50	µg/L	1.0		10/3/05
Tert-amyl methyl ether (TAME)	3.2	1.0	µg/L	1.0		10/3/05
Toluene	ND	0.50	µg/L	1.0		10/3/05
Ethylbenzene	ND	0.50	µg/L	1.0		10/3/05
m,p-Xylene	ND	0.50	µg/L	1.0		10/3/05
o-Xylene	ND	0.50	µg/L	1.0		10/3/05
Surrogate: 1,4-Dichlorobenzene-d4	103	80.8-139	% Rec	1.0		10/3/05

Test Name: TPH as Gasoline      Reference: LUFT/EPA 8260B Modified

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
TPHC Gasoline	ND	50	µg/L	1.0		10/3/05

Client Sample ID: 3577-MW5-W      Received: 9/22/05      Collected: 9/22/05 0:00  
Lab ID: 0509457-04A      Matrix: Groundwater

Test Name: Gasoline Components/Additives		Reference: LUFT/EPA 8260B Modified				
Parameter	Result	Limit	Units	DF	Extracted	Analyzed
Methyl tert-butyl ether (MTBE)	480	50	µg/L	50		10/3/05
Tert-butyl alcohol (TBA)	72	10	µg/L	1.0		10/3/05
Di-isopropyl ether (DIPE)	ND	1.0	µg/L	1.0		10/3/05
Ethyl tert-butyl ether (ETBE)	ND	1.0	µg/L	1.0		10/3/05
Benzene	7.8	0.50	µg/L	1.0		10/3/05
Tert-amyl methyl ether (TAME)	88	50	µg/L	50		10/3/05
Toluene	ND	0.50	µg/L	1.0		10/3/05
Ethylbenzene	0.85	0.50	µg/L	1.0		10/3/05
m,p-Xylene	ND	0.50	µg/L	1.0		10/3/05
o-Xylene	ND	0.50	µg/L	1.0		10/3/05
Surrogate: 1,4-Dichlorobenzene-d4	102	80.8-139	% Rec	1.0		10/3/05

Test Name: TPH as Gasoline      Reference: LUFT/EPA 8260B Modified

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
TPHC Gasoline	1,100	50	µg/L	1.0		10/3/05

Date: 06-Oct-05  
WorkOrder: 0509457

## ANALYTICAL REPORT

Client Sample ID: 3577-MW6-W

Received: 9/22/05

Collected: 9/22/05 0:00

Lab ID: 0509457-05A Matrix: Groundwater

Test Name: Gasoline Components/Additives

Reference: LUFT/EPA 8260B Modified

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
Methyl tert-butyl ether (MTBE)	ND	1.0	µg/L	1.0		10/3/05
Tert-butyl alcohol (TBA)	ND	10	µg/L	1.0		10/3/05
Di-isopropyl ether (DIPE)	ND	1.0	µg/L	1.0		10/3/05
Ethyl tert-butyl ether (ETBE)	ND	1.0	µg/L	1.0		10/3/05
Benzene	ND	0.50	µg/L	1.0		10/3/05
Tert-amyl methyl ether (TAME)	ND	1.0	µg/L	1.0		10/3/05
Toluene	ND	0.50	µg/L	1.0		10/3/05
Ethylbenzene	ND	0.50	µg/L	1.0		10/3/05
m,p-Xylene	ND	0.50	µg/L	1.0		10/3/05
o-Xylene	ND	0.50	µg/L	1.0		10/3/05
Surrogate: 1,4-Dichlorobenzene-d4	103	80.8-139	% Rec	1.0		10/3/05

Test Name: TPH as Gasoline

Reference: LUFT/EPA 8260B Modified

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
TPHC Gasoline	66	50	µg/L	1.0		10/3/05

Client Sample ID: 3577-MW7-W

Received: 9/22/05

Collected: 9/22/05 0:00

Lab ID: 0509457-06A Matrix: Groundwater

Test Name: Gasoline Components/Additives

Reference: LUFT/EPA 8260B Modified

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
Methyl tert-butyl ether (MTBE)	990	50	µg/L	50		10/3/05
Tert-butyl alcohol (TBA)	58	10	µg/L	1.0		10/3/05
Di-isopropyl ether (DIPE)	ND	1.0	µg/L	1.0		10/3/05
Ethyl tert-butyl ether (ETBE)	5.2	1.0	µg/L	1.0		10/3/05
Benzene	ND	0.50	µg/L	1.0		10/3/05
Tert-amyl methyl ether (TAME)	97	1.0	µg/L	1.0		10/3/05
Toluene	ND	0.50	µg/L	1.0		10/3/05
Ethylbenzene	ND	0.50	µg/L	1.0		10/3/05
m,p-Xylene	ND	0.50	µg/L	1.0		10/3/05
o-Xylene	ND	0.50	µg/L	1.0		10/3/05
Surrogate: 1,4-Dichlorobenzene-d4	106	80.8-139	% Rec	1.0		10/3/05

Test Name: TPH as Gasoline

Reference: LUFT/EPA 8260B Modified

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
TPHC Gasoline	1,100	50	µg/L	1.0		10/3/05

Date: 06-Oct-05  
WorkOrder: 0509457

## ANALYTICAL REPORT

Client Sample ID: 3577-MW8-W

Received: 9/22/05

Collected: 9/22/05 0:00

Lab ID: 0509457-07A

Matrix: Groundwater

Test Name: Gasoline Components/Additives

Reference: LUFT/EPA 8260B Modified

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
Methyl tert-butyl ether (MTBE)	430	50	µg/L	50		10/3/05
Tert-butyl alcohol (TBA)	57	10	µg/L	1.0		10/3/05
Di-isopropyl ether (DIPE)	ND	1.0	µg/L	1.0		10/3/05
Ethyl tert-butyl ether (ETBE)	2.1	1.0	µg/L	1.0		10/3/05
Benzene	ND	0.50	µg/L	1.0		10/3/05
Tert-amyl methyl ether (TAME)	56	1.0	µg/L	1.0		10/3/05
Toluene	ND	0.50	µg/L	1.0		10/3/05
Ethylbenzene	ND	0.50	µg/L	1.0		10/3/05
m,p-Xylene	ND	0.50	µg/L	1.0		10/3/05
o-Xylene	ND	0.50	µg/L	1.0		10/3/05
Surrogate: 1,4-Dichlorobenzene-d4	107	80.8-139	% Rec	1.0		10/3/05

Test Name: TPH as Gasoline

Reference: LUFT/EPA 8260B Modified

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
TPHC Gasoline	510	50	µg/L	1.0		10/3/05

Client Sample ID: 3577-MW9-W

Received: 9/22/05

Collected: 9/22/05 0:00

Lab ID: 0509457-08A

Matrix: Groundwater

Test Name: Gasoline Components/Additives

Reference: LUFT/EPA 8260B Modified

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
Methyl tert-butyl ether (MTBE)	320	50	µg/L	50		10/3/05
Tert-butyl alcohol (TBA)	77	10	µg/L	1.0		10/3/05
Di-isopropyl ether (DIPE)	ND	1.0	µg/L	1.0		10/3/05
Ethyl tert-butyl ether (ETBE)	3.0	1.0	µg/L	1.0		10/3/05
Benzene	ND	0.50	µg/L	1.0		10/3/05
Tert-amyl methyl ether (TAME)	ND	1.0	µg/L	1.0		10/3/05
Toluene	ND	0.50	µg/L	1.0		10/3/05
Ethylbenzene	ND	0.50	µg/L	1.0		10/3/05
m,p-Xylene	ND	0.50	µg/L	1.0		10/3/05
o-Xylene	ND	0.50	µg/L	1.0		10/3/05
Surrogate: 1,4-Dichlorobenzene-d4	107	80.8-139	% Rec	1.0		10/3/05

Test Name: TPH as Gasoline

Reference: LUFT/EPA 8260B Modified

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
TPHC Gasoline	370	50	µg/L	1.0		10/3/05

Date: 07-Oct-05  
WorkOrder: 0509457

## ANALYTICAL REPORT

Client Sample ID: 3577-MW10-W      Received: 9/22/05      Collected: 9/22/05 0:00  
Lab ID: 0509457-09A      Matrix: Groundwater

Test Name: Gasoline Components/Additives

Reference: LUFT/EPA 8260B Modified

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
Methyl tert-butyl ether (MTBE)	330	50	µg/L	50		10/3/05
Tert-butyl alcohol (TBA)	62	10	µg/L	1.0		10/3/05
Di-isopropyl ether (Dipe)	ND	1.0	µg/L	1.0		10/3/05
Ethyl tert-butyl ether (ETBE)	ND	1.0	µg/L	1.0		10/3/05
Benzene	ND	0.50	µg/L	1.0		10/3/05
Tert-amyl methyl ether (TAME)	34	1.0	µg/L	1.0		10/3/05
Toluene	ND	0.50	µg/L	1.0		10/3/05
Ethylbenzene	ND	0.50	µg/L	1.0		10/3/05
m,p-Xylene	ND	0.50	µg/L	1.0		10/3/05
o-Xylene	ND	0.50	µg/L	1.0		10/3/05
Surrogate: 1,4-Dichlorobenzene-d4	105	80.8-139	% Rec	1.0		10/3/05

Test Name: TPH as Gasoline

Reference: LUFT/EPA 8260B Modified

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
TPHC Gasoline	400	50	µg/L	1.0		10/3/05

Client Sample ID: 3577-QCTB-W

Received: 9/22/05

Collected: 9/22/05 0:00

Lab ID: 0509457-10A      Matrix: Trip Blank

Test Name: Gasoline Components/Additives

Reference: LUFT/EPA 8260B Modified

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
Methyl tert-butyl ether (MTBE)	ND	1.0	µg/L	1.0		10/3/05
Tert-butyl alcohol (TBA)	ND	10	µg/L	1.0		10/3/05
Di-isopropyl ether (Dipe)	ND	1.0	µg/L	1.0		10/3/05
Ethyl tert-butyl ether (ETBE)	ND	1.0	µg/L	1.0		10/3/05
Benzene	ND	0.50	µg/L	1.0		10/3/05
Tert-amyl methyl ether (TAME)	ND	1.0	µg/L	1.0		10/3/05
Toluene	ND	0.50	µg/L	1.0		10/3/05
Ethylbenzene	ND	0.50	µg/L	1.0		10/3/05
m,p-Xylene	ND	0.50	µg/L	1.0		10/3/05
o-Xylene	ND	0.50	µg/L	1.0		10/3/05
Surrogate: 1,4-Dichlorobenzene-d4	103	80.8-139	% Rec	1.0		10/3/05

Test Name: TPH as Gasoline

Reference: LUFT/EPA 8260B Modified

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
TPHC Gasoline	ND	50	µg/L	1.0		10/3/05

## North Coast Laboratories, Ltd.

Date: 06-Oct-05

**CLIENT:** LACO Associates  
**Work Order:** 0509457  
**Project:** 3577.02, HPI Rio Dell Shell

**OC SUMMARY REPORT**  
Method Blank

Sample ID	MB 093005	Batch ID:	R37280	Test Code:	8260OXYW	Units:	µg/L	Analysis Date	10/3/05 12:29:00 PM	Prep Date		
Client ID:		Run ID:		ORGCMS3_050930B		SeqNo:	536518					
Analyte		Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Methyl tert-butyl ether (MTBE)		ND	1.0									
Tert-butyl alcohol (TBA)		ND	10									
Di-isopropyl ether (DIPE)		ND	1.0									
Ethyl tert-butyl ether (ETBE)		ND	1.0									
Benzene		ND	0.50									
Tert-amyl methyl ether (TAME)		ND	1.0									
Toluene		ND	0.50									
Ethylbenzene		0.1095	0.50								J	
m,p-Xylene		0.1805	0.50								J	
o-Xylene		ND	0.50									
1,4-Dichlorobenzene-d4		1.02	0.10	1.00	0	102%	81	139	0			
Sample ID	MB 093005	Batch ID:	R37278	Test Code:	GASW-MS	Units:	µg/L	Analysis Date	10/3/05 12:29:00 PM	Prep Date		
Client ID:		Run ID:		ORGCMS3_050930A		SeqNo:	536496					
Analyte		Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
TPHC Gasoline		24.61	50								J	

Qualifiers:

ND - Not Detected at the Reporting Limit

J - Analyte detected below quantitation limits

S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

B - Analyte detected in the associated Method Blank

# North Coast Laboratories, Ltd.

Date: 06-Oct-05

## OC SUMMARY REPORT

Laboratory Control Spike

**CLIENT:** LACO Associates  
**Work Order:** 0509457  
**Project:** 3577.02, HPI Rio Dell Shell

Sample ID	Batch ID:	Test Code:	Units: µg/L	Analysis Date 10/3/05 9:56:00 AM				Prep Date				
Client ID:		Run ID:	ORGCMS3_050930B	SeqNo:	536516	% Rec	LowLimit	HighLimit	RPD Ref Val	% RPD	RPD Limit	Qual
Analyte	Result	Limit	SPK value	SPK Ref Val								
Methyl tert-butyl ether (MTBE)	18.06	1.0	20.0	0	90.3%	80	120	120	0	0.00%	20	0
Tert-butyl alcohol (TBA)	385.3	10	400	0	96.3%	25	162	162	0	9.10%	20	0
Di-isopropyl ether (DIPE)	18.25	1.0	20.0	0	91.2%	80	120	120	0	4.54%	20	0
Ethyl tert-butyl ether (ETBE)	18.17	1.0	20.0	0	90.8%	77	120	120	0	10.6%	20	0
Benzene	18.95	0.50	20.0	0	94.8%	78	117	117	0	3.41%	20	0
Tert-amyl methyl ether (TAME)	18.24	1.0	20.0	0	91.2%	64	136	136	0	1.37%	20	0
Toluene	18.77	0.50	20.0	0	93.8%	80	120	120	0	2.39%	20	0
Ethylbenzene	17.84	0.50	20.0	0	89.2%	80	120	120	0	12.0%	20	0
m,p-Xylene	36.03	0.50	40.0	0	90.1%	80	120	120	0	5.20%	20	0
o-Xylene	17.36	0.50	20.0	0	86.8%	80	120	120	0	5.07%	20	0
1,4-Dichlorobenzene-d4	1.08	0.10	1.00	0	108%	81	139	139	0			
Sample ID	Batch ID:	Test Code:	Units: µg/L	Analysis Date 10/3/05 7:16:00 AM				Prep Date				
Client ID:		Run ID:	ORGCMS3_050930B	SeqNo:	536532							
Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	% RPD	RPD Limit	Qual	
Methyl tert-butyl ether (MTBE)	16.51	1.0	20.0	0	82.5%	80	120	18.1	9.00%	20		
Tert-butyl alcohol (TBA)	351.7	10	400	0	87.9%	25	162	385	9.10%	20		
Di-isopropyl ether (DIPE)	17.44	1.0	20.0	0	87.2%	80	120	18.2	4.54%	20		
Ethyl tert-butyl ether (ETBE)	16.35	1.0	20.0	0	81.7%	77	120	18.2	10.6%	20		
Benzene	19.41	0.50	20.0	0	97.1%	78	117	19.0	2.39%	20		
Tert-amyl methyl ether (TAME)	16.19	1.0	20.0	0	80.9%	64	136	18.2	12.0%	20		
Toluene	19.42	0.50	20.0	0	97.1%	80	120	18.8	3.41%	20		
Ethylbenzene	18.08	0.50	20.0	0	90.4%	80	120	17.8	1.37%	20		
m,p-Xylene	37.04	0.50	40.0	0	92.6%	80	120	36.0	2.79%	20		
o-Xylene	16.48	0.50	20.0	0	82.4%	80	120	17.4	5.20%	20		
1,4-Dichlorobenzene-d4	1.14	0.10	1.00	0	114%	81	139	1.08	5.07%	20		

Qualifiers:

ND - Not Detected at the Reporting Limit

J - Analyte detected below quantitation limits

S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

B - Analyte detected in the associated Method Blank

**QC SUMMARY REPORT**  
Laboratory Control Spike

**CLIENT:** LACO Associates  
**Work Order:** 0509457  
**Project:** 3577.02, HPI Rio Dell Shell

Sample ID	Batch ID:	Test Code:	Units:	Analysis Date	Prep Date					
Client ID:	Run ID:	ORGCMS3_050930A	µg/L	SeqNo:						
Analyte	Result	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
TPHC Gasoline	847.8	50	1,000	0	84.8%	80	120	0		
Sample ID	Batch ID:	Test Code:	Units:	Analysis Date	Prep Date					
Client ID:	Run ID:	ORGCMS3_050930A	µg/L	SeqNo:						
Analyte	Result	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
TPHC Gasoline	804.7	50	1,000	0	80.5%	80	120	848	5.21%	20

**Qualifiers:**

ND - Not Detected at the Reporting Limit

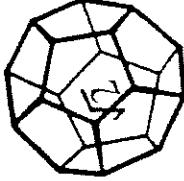
J - Analyte detected below quantitation limits

S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

B - Analyte detected in the associated Method Blank

**NORTH COAST  
LABORATORIES LTD.**



**Chain of Custody**

5630 West End Road • Arcata • CA 95521-9202  
707-822-4649 Fax 707-822-6831

LABORATORY NUMBER: 0509454

Attention:	Accounts Payable
Results & Invoice to:	Laco Associates
Address:	21 W. 4th St. Eureka CA 95501
Phone:	(707) 443-5054
Copies of Report to:	LACO; Chris Watt
Sampler (Sign & Print):	<i>Shat</i>

**PROJECT INFORMATION**

Project Number: 3577.02  
Project Name: HPI Rio Dell Shell  
Purchase Order Number: TASK -  
*3027*

LAB ID	SAMPLE ID	DATE	TIME	MATRIX*
3577-MW2-W		9-22-05	AM	GW
3577-MW3-W				3
3577-MW4-W				3
3577-MW5-W				3
3577-MW6-W				3
3577-MW7-W				3
3577-MW8-W				3
3577-MW9-W				3
3577-MW10-W				3
3577-QCTB-W			PM	1

REQUISITIONED BY (Sign & Print)

*Steve Davis*

DATE/TIME

9-22-05

3:59 pm

RECEIVED BY (Sign)

*J. Thompson*

DATE/TIME

9/22/05

6:00

SAMPLE DISPOSAL

NCL Disposal of Non-Contaminated

Return

PICKUP

Fed Ex

Air Ex

Bus Hand

\*MATRIX: DW=Drinking Water; Eff=Effluent; Inf=Influent; SW=Surface Water; GW=Ground Water; S=Soil; O=Other.

**ALL CONTAMINATED NON-AQUEOUS SAMPLES WILL BE RETURNED TO CLIENT**